

## CLAIMS

1. A process for the preparation of a cyclopentadienyl metal salt comprising the step of reacting a cyclopentadiene and a metal hydride in the presence of an amine compound.

2. A process according to claim 1, wherein said amine compound is a primary amine or a secondary amine.

3. A process according to claim 2, wherein said primary amine is a primary aniline.

4. A process according to any one of claims 1 to 3, wherein an amount of said amine compound is from 0.001 to 2 moles per one mole of said metal hydride.

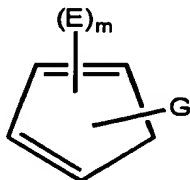
5. A process according to any one of claims 1 to 3, wherein an amount of said amine compound is from 0.01 to 0.5 mole per one mole of said metal hydride.

6. A process according to any one of claims 1 to 5, wherein an amount of said metal hydride is from 0.5 to 3 moles per one mole of said cyclopentadiene.

7. A process according to any one of claims 1 to 6, wherein said metal hydride contains mineral oils.

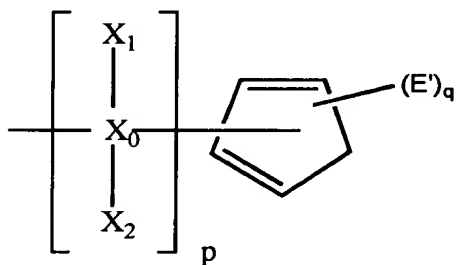
8. A process according to any one of claims 1 to 7, wherein a reaction temperature is from 10 to 60°C.

9. A process according to any one of claims 1 to 8, wherein said cyclopentadiene is a compound of the formula (2a):



wherein m is an integer of 0 to 5, E groups are the same or different and independently represent a C<sub>1</sub>-C<sub>8</sub> alkyl group, a phenyl group, a naphthyl group, or a tri-substituted silyl group having substituents selected from the group consisting of a C<sub>1</sub>-C<sub>4</sub> alkyl group and a phenyl group, provided that, when two E groups are present on adjacent carbon atoms, they may be bonded at their ends to form a benzene ring, a cyclohexane ring or a cyclohexene ring, which is condensed with the cyclopentadienyl ring,

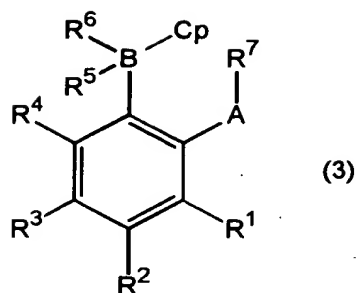
G is a hydrogen atom when m is 5, or when m is 0 to 4, G is a hydrogen atom or a group of the formula (2b):



wherein p is 1 or 2, q is an integer of 0 to 4, X<sub>0</sub> is a carbon atom or a silicon atom, X<sub>1</sub> and X<sub>2</sub> are the same or different and independently represent a hydrogen atom, a C<sub>1</sub>-C<sub>4</sub> alkyl group or a phenyl group, E' is a substituent selected from those defined for E, provided that when X<sub>0</sub> is a silicon atom, X<sub>1</sub> and X<sub>2</sub> are not hydrogen atoms.

10. A process according to claim 9, wherein m is an integer of 2 to 5, or m is 1 and G is a group of the formula (2b).

11. A process for the preparation of a cyclopentadiene derivative of the formula (3):



wherein

A is an atom of the 16 group of the Periodic Table,

B is an atom of the 14 group of the Periodic Table,

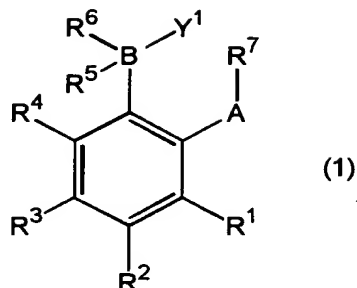
5  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  and  $R^6$  are the same or different and independently represent a hydrogen atom, a fluorine atom, a  $C_1$ - $C_{20}$  alkyl group which may optionally be substituted with a fluorine atom, a  $C_7$ - $C_{20}$  aralkyl group which may optionally be substituted with a fluorine atom, a  $C_6$ - $C_{20}$  aryl group which may optionally be substituted with a fluorine atom, a  $C_1$ - $C_{20}$  substituted silyl group, a  $C_1$ - $C_{20}$  alkoxy group which may optionally be substituted with a fluorine atom, a  $C_7$ - $C_{20}$  aralkyloxy group which may optionally be substituted with a fluorine atom, a  $C_6$ - $C_{20}$  aryloxy group which may optionally be substituted with a fluorine atom, or a  $C_2$ - $C_{20}$  di-substituted amino group which may optionally be substituted with a fluorine atom, provided that any two or more of  $R^1$ ,  $R^2$ ,  $R^3$ ,  $R^4$ ,  $R^5$  and  $R^6$  may together form a ring,

15  $R^7$  is a hydrocarbon group which may optionally be substituted with a fluorine atom, or a tri-substituted silyl group,

and

20 Cp is a cyclopentadiene ring comprising the step of reacting a halide compound of the

formula (1):



wherein A, B, R<sup>1</sup>, R<sup>2</sup>, R<sup>3</sup>, R<sup>4</sup>, R<sup>5</sup>, R<sup>6</sup> and R<sup>7</sup> are the same as defined above, and Y<sup>1</sup> is a chlorine atom, a bromine atom or an iodine atom

with a cyclopentadiene of the formula (2):



wherein Cp is the same as defined above, in the presence of a metal hydride and an amine compound.

12. A process according to claim 11, wherein said cyclopentadiene of the formula (2) is reacted with said metal hydride in the presence of said amine compound, and then reacted with said halide compound of the formula (1).

13. A process according to claim 11 or 12, wherein said cyclopentadiene of the formula (2) is a compound of the formula (2a) in claim 9.

14. A process according to claim 11 or 12, wherein said amine compound is a primary amine or a secondary amine.

15. A process according to claim 14, wherein said primary amine is a primary aniline.

a 16. A process according to claim 12 ~~to 13~~, wherein an amount of said amine compound is from 0.001 to 2 moles per one mole of said metal hydride.

a 17. A process according to claim 12 ~~to 13~~, wherein an

amount of said amine compound is from 0.01 to 0.5 mole per one mole of said metal hydride.

2 18. A process according to any one of claims 11 <sup>or 12</sup> ~~to 13~~, wherein an amount of said metal hydride is from 0.5 to 3 moles per one mole of said compound of the formula (2).

5 2 19. A process according to any one of claims 11 <sup>or 12</sup> ~~to 17~~, wherein a reaction temperature is from 10 to 60°C. N

2 20. A process according to any one of claims 11 <sup>or 12</sup> ~~to 19~~, wherein said metal hydride contains mineral oils.

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